The EIA Ethanol Corn-Input Signal, A Residualized Demand Alpha Lens

Reading EIA daily US ethanol corn-input volumes, residualized against an ES + DX + CL + GC macro basis to strip common macro beta and isolate idiosyncratic ethanol-corn-demand alpha. Full-sample IC plus 0.012 at p=0.43 (not significant as a standalone directional signal). Use as a demand-regime complement to the fundamental signals.

David Stendahl · Market Lab Analytics · November 2, 2026

What this signal is, with the limits stated upfront

Ethanol accounts for approximately 40 percent of annual US corn consumption. The EIA publishes daily data on US ethanol production and corresponding corn-grind volumes. The raw ethanol corn-input series is dominated by macro factors (crude oil prices affecting ethanol-vs-gasoline economics, DX affecting US-vs-Brazil ethanol competitiveness, broader market beta). The signal strips these out via residualization against an ES + DX + CL + GC basket, leaving idiosyncratic ethanol-corn-demand alpha.

The signal reads daily EIA ethanol corn-input volumes, linear-regression-residualizes against ES (equities) + DX (dollar) + CL (crude) + GC (gold), z-scores the residual, and tanh-bounds to minus 1 to plus 1. Composite above plus 0.5 is Ethanol Demand High. Composite below minus 0.5 is Ethanol Demand Low. The middle band is Neutral.

Current reading, as of October 30, 2026: composite plus 0.58 (Ethanol Demand High band). The residualized ethanol corn-input reads above baseline, indicating idiosyncratic ethanol-demand strength beyond what macro factors would predict.

Daily Spearman IC against CBOT Corn fwd 60-day return is plus 0.012 at p-value 0.43 across 4,083 live-signal days — NOT significant as a standalone directional signal. The signal captures demand-regime dynamics but doesn't translate cleanly to 60-day forward corn prices alone.

Limits upfront: this is a DEMAND REGIME COMPLEMENT, not a standalone directional signal. Full-sample IC is not significant. Use alongside the direct supply signals (Ending Stocks, phenology) and the China-demand signals (CNY, China Share Velocity) for the overall demand picture.

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How the ethanol residualized composite composes

Direct observation: EIA daily US ethanol corn-input volumes. From the EIA Weekly Ethanol Plant Production and Grain Use report, forward-filled to daily resolution.

Derived construction:

1. Linear regression of raw ethanol corn-input against ES, DX, CL, GC daily returns.
2. Compute the residual (idiosyncratic ethanol demand not explained by macro).
3. Z-score the residual on a rolling window.
4. Tanh-bound to minus 1 to plus 1.

State thresholds. Composite above plus 0.5 is Ethanol Demand High. Composite below minus 0.5 is Ethanol Demand Low. The middle band is Neutral.

The macro residualization is the key construction choice. Raw ethanol corn-input is dominated by macro factors; residualization isolates the ethanol-specific signal that would be invisible in the raw series.

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What the state-conditional returns have actually done

> **Reference baseline, CBOT Corn fwd 60-day unconditional**
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> CBOT Corn back-adjusted continuous forward-60-day return baseline over the live-signal window of 2010 through 2026-10-30: mean plus 0.29 percent, median minus 1.01 percent, standard deviation 10.89 percent, percent negative 56.6 percent.

Ethanol Demand Low (composite below minus 0.5) covers 9.6 percent of the sample. Per-day mean minus 7.19 percent, edge minus 7.48 pp below baseline. Low-demand regime strongly bearish.

Ethanol Demand Neutral (composite between minus 0.5 and plus 0.5) covers 64.3 percent of the sample. Per-day mean minus 6.62 percent, edge minus 6.91 pp below baseline. The dominant state is also bearish on fwd 60d.

Ethanol Demand High (composite above plus 0.5) covers 26.0 percent of the sample. Per-day mean minus 5.33 percent, edge minus 5.62 pp below baseline. High-demand regime is less-bad but still bearish.

The three-regime stats are all bearish-biased against the baseline. The spread between Ethanol Demand High and Low is plus 1.86 pp — a modest monotone pattern, but the overall bearish bias in all three states means the signal is best read as a regime indicator rather than a standalone directional trade. The full-sample Spearman IC of plus 0.012 (not significant) confirms the standalone-trading limitation.

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Three cases that frame how to read this signal

Case 1: 2020. COVID demand collapse.

The 2020 COVID lockdowns collapsed US gasoline demand, which flowed through to ethanol demand and reduced corn-grind volumes. The residualized signal fired into Ethanol Demand Low. Corn drifted on the demand-weakness setup.

Case 2: 2021. Post-COVID recovery surge.

Through 2021 US gasoline demand recovered sharply and ethanol corn-grind volumes surged. The signal fired into Ethanol Demand High. Corn rallied through 2021 on stacked demand-side factors.

Case 3: Current. Ethanol Demand High reading.

As of October 30, 2026, the signal reads composite plus 0.58 (Ethanol Demand High band). The residualized ethanol corn-input reads above baseline, indicating idiosyncratic ethanol-demand strength. Pair with Z4393 Stocks Loosening (supply abundant) and Z4642 CNY Weak (China demand strong) for the full demand-side picture.

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How to use the signal today

As of November 2, 2026, the composite reads plus 0.58 and the state is Ethanol Demand High. The signal reads above-baseline ethanol-specific demand.

Standalone trading on this signal carries low conviction (IC not significant). Use as a demand-regime complement:

- **Z4393 US Corn Ending Stocks YoY.** The supply-balance signal.
- **Z4642 CNY Strength (Inverted).** The China-demand lead.
- **Z4652 US vs IMF Global Corn Price Ratio.** The relative-value export-precursor signal.
- **Y852 Corn Cycle DNA.** The multi-input phenology-plus-condition playbook.

The ethanol signal is best used as part of a stacked demand-regime read.

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Methodology notes

Data sources. EIA Weekly Ethanol Plant Production and Grain Use report (daily corn-grind volumes). ES, DX, CL, GC daily returns for the macro residualization basis.

Signal construction. Linear regression of ethanol corn-input against ES + DX + CL + GC. Z-score the residual. Tanh-bound to minus 1 to plus 1. State thresholds plus or minus 0.5 extreme and plus or minus 0.2 moderate. Target: CBOT Corn back-adjusted continuous.

Validation statistics. Daily Spearman IC against CBOT Corn fwd 60-day return is plus 0.012 at p-value 0.43 across 4,083 live-signal days (NOT significant). Three-regime per-day means: Ethanol Demand Low minus 7.19 percent (edge minus 7.48 pp vs plus 0.29 percent baseline), Ethanol Demand Neutral minus 6.62 percent (edge minus 6.91 pp), Ethanol Demand High minus 5.33 percent (edge minus 5.62 pp). All three bearish-biased; interpret as regime indicator, not standalone directional trade.

What this signal does not cover

First, this is NOT a standalone directional signal. Full-sample IC is not significant. Use as a demand-regime complement to the direct signals.

Second, the macro residualization uses a fixed basket (ES + DX + CL + GC). Other macro factors (NG, DX components, non-US gasoline markets) are not in the basis.

Third, ethanol policy changes (EPA RVO revisions, SAF competition, E15 summer-blend expansion) can shift the ethanol-demand regime structurally in ways the residualization partially but not fully captures.

Fourth, the signal reads US ethanol only. Brazilian ethanol production (sugar-cane-based competition) is not captured.

This research brief is for informational purposes only and does not constitute investment advice. Data sources: EIA Weekly Ethanol Plant Production and Grain Use report, ES + DX + CL + GC daily returns for residualization, CBOT Corn back-adjusted continuous target. State-conditional statistics computed through 2026-10-30.